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(71) 出願人 000004260

株式会社デンソー

愛知県刈谷市昭和町1丁目1番地

(72) 発明者 岩瀬 舞彦

愛知県刈谷市昭和町1丁目1番地 株式会社
デンソー内

(74) 代理人 100100022

弁理士 伊藤 洋二 (外2名)

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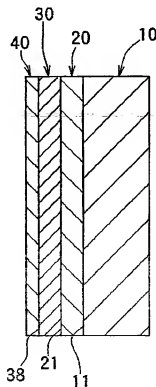
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(54) 【発明の名称】 車両用表示装置の表示板

(57) 【要約】

【課題】 オンデマンド印刷手法の用い方に工夫を凝らし、スクリーン印刷手法を用いたと実質的に同様の自動車の表示装置用表示板を提供する。

【解決手段】 接着材層20が透明基板10の表面に形成されている。印刷層30が接着材層20の表面にオンデマンド印刷機により印刷形成されている。光沢調整層40が印刷層30の表面にオンデマンド印刷機により印刷形成されている。



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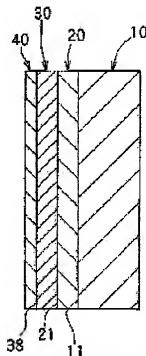
(72)Inventor : IWASE TERUHIKO

(54) DISPLAY PANEL OF DISPLAY DEVICE FOR VEHICLE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a display panel for the display device of a car substantially the same to a display panel using a screen printing technique by putting stress on a way to use an on-demand printing technique.

SOLUTION: An adhesive layer 20 is formed on a transparent substrate 10, and a printing layer 30 is formed on the surface of the adhesive layer 20 by printing using an on-demand printing machine. A gloss adjusting layer 40 is formed on the surface of the printing layer 30 by printing using the on-demand printing machine.



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[Claim(s)]

[Claim 15] In the plotting board for displays of a car equipped with a translucency substrate (10) and the printing layer (30) formed in the field of said translucency substrate of printing so that it may have a translucent part (30a thru/or 30e) in this background, while having a background (30g) as a non-translucent part It is the plotting board for displays of the car which is equipped with the glue line (20) formed in the field of said translucency substrate, and is characterized by carrying out printing formation on the front face of said glue line so that said printing layer may have said translucent part said background and in this background with a print-on-demand means based on print data.

[Claim 2] The plotting board for displays of the car according to claim 1 characterized by forming in the front face of said printing layer the gloss adjustment layer (40) adjusted so that the gloss of this front face may be taken off by said print-on-demand means.

[Claim 3] Said printing layer is the plotting board for displays of the car according to claim 1 or 2 characterized by having at the periphery edge as an adjustable information record display (30f) which indicates the adjustable information about a car by record.

[Claim 4] Said adjustable information record display is the display board for displays of the car according to claim 3 characterized by including the production information by the can van method about a display board as said adjustable information.

[Claim 5] In the plotting board for displays of a car equipped with a translucency substrate (10) and the printing layer (30) formed in the field of said translucency substrate of printing so that it may have a translucent part (30a thru/or 30e) in this background, while having a background (30g) as a non-translucent part said printing layer The plotting board for displays of the car characterized by carrying out printing formation by the print-on-demand means so that it may have said translucent part said background and in this background on the front face of said translucency substrate.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the plotting board of displays, such as an instrument with which cars, such as an automobile, are equipped.

[0002]

[Description of the Prior Art] There is a thing equipped with the instrument board and the light source arranged in the rear-face side of this instrument board in the instrument for the former, for example, passenger cars. Here, a gauge board prints the translucent part and the non-translucent part as a background which become the front face of the transparence substrate of the resin of a polycarbonate from a graduation or an alphabetic character by the screen-stencil approach, and, usually it is constituted. He is trying for this to display brightly only the alphabetic character and graduation which are a translucent part among the instrument boards with illuminating the instrument board according to the light source in Nighttime.

[0003]

[Problem(s) to be Solved by the Invention] By the way, since the screen-stencil approach is used like *** in printing of the front face of the instrument board in the above-mentioned instrument, it is possible to make printing concentration of a non-translucent part deep. However, in the instrument for passenger cars, since a type of a car, displacement, grade, etc. of a passenger car are various, while the instrument board also covers many forms in accordance with this, the contents of printing also differ mutually. therefore — the screen-stencil technique which is the extensive printing technique — exchange of the printing version, ink preparation, and condition appearance — carrying out — etc. — there is fault that housekeeping is needed whenever the forms of the instrument board differ. Especially, when the printing lot of the instrument board is a small lot, rather than actual printing time amount, the direction of the time amount which the above-mentioned housekeeping takes becomes long, and the rise of a manufacturing cost is caused. Moreover, there is also fault that a platemaking process, lithographic plate manufacture, ink preparation, etc. take time amount in manufacture of the prototype of the instrument board etc.

[0004] It is possible to adopt the real-time printing technique (the so-called print-on-demand technique) which is spreading in the quotient printing field to this in recent years. Unlike the screen-stencil technique, this print-on-demand technique is excellent in quick and the point which enables multi-form smallness lot printing with low cost not using the printing version. However, since this print-on-demand technique mainly aims at printing on paper, it is not suitable for printing deeply the concentration of printing stably on the front face of the transparence substrate of the above resins which need endurance, or a non-translucent part in principle.

[0005] Then, in order that this invention may cope with the above mentioned, it elaborates how to use the print-on-demand technique, and aims at offering the plotting board for displays of the same car substantially using the screen-stencil technique.

[0006]

[Means for Solving the Problem] In solution of the above-mentioned technical problem, the

plotting board for displays of the car concerning invention according to claim 1 is equipped with the printing layer (30) formed in the field of a translucency substrate of printing so that it may have a translucent part (30a thru/or 30e) in this background while it has a translucency substrate (10) and a background (30g) as a non-translucent part.

[0007] In the plotting board concerned, it has the glue line (20) formed in the field of a translucency substrate, and a printing layer is characterized by carrying out printing formation on the surface of a glue line so that it may have a translucent part a background and in this background with a print-on-demand means based on print data.

[0008] thus, the case of printing by the conventional screen printer since printing formation of the printing layer is carried out so that it may have a translucent part a background and in this background on the surface of a glue line with a print-on-demand means based on print data — like — exchange of the printing version, ink preparation, and condition appearance — carrying out — etc. — housekeeping is not needed, but large compaction of printing time amount is attained, and the plotting board can be obtained at short time for delivery by low cost.

[0009] Moreover, since the printing layer was printed on the front face of the glue line which it comes to form in the field of a translucency substrate, a printing layer sticks to the field of a translucency substrate uniformly through the basis of the adhesive strength of a glue line, and this glue line. Therefore, the printing layer concerned does not exfoliate from the field of a translucency substrate. Therefore, the plotting board which has the quality same in operation with having printed by screen-stencil can be obtained.

[0010] Moreover, in invention according to claim 2, it is characterized by forming in the front face of a printing layer the gloss adjustment layer (40) adjusted so that the gloss of this front face may be taken off by the print-on-demand means in the plotting board for displays of a car according to claim 1.

[0011] Thereby, since the gloss of the front face of a printing layer is adjusted by the gloss adjustment layer and taken off, even if outdoor daylight, such as sunlight, carries out incidence to the plotting board through a gloss adjustment layer, the reflectivity of this incident light is eased sharply. Moreover, since the gloss of the front face of a printing layer is adjusted by the gloss adjustment layer and taken off as mentioned above, the face projection in the front face of a printing layer is hardly worried, either. Therefore, even if it sees the printing layer of the plotting board through the gloss adjustment layer, very good visibility is securable.

[0012] Moreover, in invention according to claim 3, a printing layer is characterized by having at the periphery edge as an adjustable information record display (30f) which indicates the adjustable information about a car by record in the plotting board for displays of a car according to claim 1 or 2.

[0013] Thereby, the periphery section of a printing layer can insert [thing / of the printing layer concerned / out of range / visible / or visible appending a bar code, the QR code, etc. which show product information, production information, etc. to the periphery section concerned as an adjustable information record display, and indicating by record, in corresponding near the part removed by appearance processing] in the production information in which adjustable is possible. Moreover, the salability of an instrument can be improved by inserting an edition number in the display board of a limited car as an adjustable information record display for every product, without causing the rise of big cost.

[0014] Moreover, in invention according to claim 4, an adjustable information record display is characterized by including the production information by the can van method about a display board as adjustable information in the display board for indicating equipments of a car according to claim 3.

[0015] This can also attain the same operation effectiveness as invention according to claim 3.

[0016] Moreover, the plotting board for displays of the car concerning invention according to claim 5 is equipped with the printing layer (30) formed in the field of a translucency substrate of printing so that it may have a translucent part (30a thru/or 30e) in this background while it has a translucency substrate (10) and a background (30g) as a non-translucent part. In the display board concerned, a printing layer is characterized by carrying out printing formation so that it may have a translucent part a background and in this background on the front face of a

translucency substrate with a print-on-demand means.

[0017] the case of printing by the conventional screen printer since printing formation of the printing layer is carried out by this so that it may have a translucent part a background and in this background on the surface of a glue line with a print-on-demand means based on print data -- like -- exchange of the printing version, ink preparation, and condition appearance -- carrying out -- etc. -- housekeeping is not needed, but large compaction of printing time amount is attained, and the plotting board can be obtained at short time for delivery by low cost.

[0018] In addition, the sign in the parenthesis of each above-mentioned means shows correspondence relation with the concrete means of a publication to the operation gestalt mentioned later.

[0019]

[Embodiment of the Invention] Hereafter, 1 operation gestalt of this invention is explained using a drawing. Drawing 1 and drawing 2 show an example of the instrument board adopted as the instrument for passenger cars. This instrument board is constituted by the transparence substrate 10, the binder layer 20, the printing layer 30, and the gloss adjustment layer 40.

[0020] The transparence substrate 10 is constituted by the tabular synthetic resin of transparence. Spreading formation of the binder layer 20 is carried out on the front face 11 of the transparence substrate 10 by the resin binder of transparence at the shape of a layer.

[0021] Printing formation is carried out on the front face 21 of the binder layer 20 by the print-on-demand machine at the shape of a layer, and the printing layer 30 has four circular graduation sections 30a thru/or 30d, direction directions mark section 30e, and 30f of adjustable information record displays in 30g of backgrounds, as drawing 1 shows this printing layer 30.

[0022] In the illustration left-hand side section, focusing on the through hole section H1, graduation section 30a sets spacing in the direction of radii, arranges the slit-like graduation 31 of Sanjo in it to a radial, and it consists of drawing 1 of the instrument board. In the illustration right-hand side section, focusing on the through hole section H2, graduation section 30b sets spacing in the direction of radii, arranges the slit-like graduation 32 of Sanjo in it to a radial, and it consists of drawing 1 of the instrument board.

[0023] Focusing on the through hole section H3, graduation section 30c sets spacing in the direction of radii, arranges the slit-like graduation 33 of Kujo in it to a radial, and it consists of center-section left-hand side of the instrument board. Moreover, focusing on the through hole section H4, 30d of graduation sections sets spacing in the direction of radii, they arrange the slit-like graduation 34 of Kujo in it to a radial, and it consists of center-section right-hand side of the instrument board. In addition, each through hole section H1 thru/or H4 are formed in the direction of board thickness in the location shown in the instrument board concerned by drawing 1 in the direction of board thickness, respectively.

[0024] Direction directions mark section 30e is equipped with the both-directions directions marks 35 and 36, and these both-directions directions marks 35 and 36 are formed so that it may have the arrow-head configuration of the reverse sense mutually in the illustration upper part of the instrument board in drawing 1 among both the graduation sections 33 and 34. 30f of adjustable information record displays sets and arranges five displays 37 in the illustration margo-inferior section, and it constitutes spacing from drawing 1 of the instrument board in them.

[0025] 30g of backgrounds is a non-translucent part, and graduation section 30a thru/or 30d, and direction directions mark section 30e are formed as a translucent part in this non-translucent part, respectively. Moreover, 30f of adjustable information record displays is formed in the location in which it hides by the annular bottom wall of the above-mentioned reward plate among the above-mentioned non-translucent parts when an annular reward plate is attached on the instrument board concerned. Here, a bar code, the QR code, etc. which show can van information (information for carrying out direct printing production of the production required number of a gauge board), product information, production information, etc. about a production system on a gauge board are contained in 30f of adjustable information record displays.

[0026] The gloss adjustment layer 40 is carried out on the front face 38 of the printing layer 30 with a lusterless ingredient, and printing formation is carried out with the print-on-demand

machine at the shape of a layer. This gloss adjustment layer 40 plays the role which takes off the gloss produced by outdoor daylight on the front face of the printing layer 30.

[0027] In this operation gestalt constituted as mentioned above, the instrument board concerned is the following, and is made and manufactured. First, the tabular polycarbonate (Mitsubishi Gas Chemical Co., Inc. make) of transparence is adopted as the above-mentioned tabular synthetic resin, this tabular synthetic resin is cut in a predetermined configuration, and the transparence substrate 10 is formed. In addition, the above-mentioned tabular synthetic resin may be not only a polycarbonate but polyethylene terephthalate and nylon, ABS, etc.

[0028] Next, a polyester system resin binder (it has an elastic modulus 5×10^5 at 80 degrees C) is adopted as a resin binder of transparence, the resin binder of this transparence is applied to the front face of the transparence substrate 10 in the shape of a layer by the thickness of 20 micrometers thru/or 30 micrometers, and the binder layer 20 is formed. In addition, as a formation ingredient of this binder layer 20, you may be a translucency binder, without restricting to a resin binder.

[0029] The following results were obtained, when the instrument board manufactured so that it might incidentally have the same configuration as the above-mentioned instrument board except for the point in which the binder layer 20 was formed, with the resin binder which has an elastic modulus 8×10^4 at 80 degrees C was prepared as an example of a comparison and this example of a comparison was compared with the instrument board in the above-mentioned operation gestalt.

[0030] That is, even if it left the instrument board and the above-mentioned example of a comparison which were stated with the above-mentioned operation gestalt for 1000 hours within the ambient atmosphere with a% [of humidity] of 95, and a temperature of 65 degrees C, they showed neither of abnormalities. However, although the instrument board stated with the above-mentioned operation gestalt did not show abnormalities when it was left within a 100-degree C ambient atmosphere for 1000 hours, the above-mentioned example of a comparison showed abnormalities, and produced the float in the interface of a transparence substrate.

[0031] Although the quality of the material of a binder layer is selectable, since it generally became 80 degrees C or more from such an examination result by sunlight, heat dissipation of interior lighting and an electrical machinery and apparatus, etc. by passenger car according to the print-on-demand method of a printing layer, thermal resistance was required, the resin whose elastic modulus in 80 degrees C is more than 1×10^5 (Pa) was desirable, and it turned out also in 100 degrees C that the resin whose elastic modulus is more than 1×10^5 (Pa) is still more suitable. Specifically, polyester system resin, urethane system resin, acrylic resin, etc. can adopt as formation ingredients of a binder layer.

[0032] Thus, after forming the binder layer 20, printing formation of the printing layer 30 is carried out on the front face of the binder layer 20 as follows at the shape of a layer. Here, as a print-on-demand machine, an ink jet method printing machine or an electrophotography method printing machine (for example, laser beam printer) is adopted. However, the above-mentioned print-on-demand machine is controlled by the proper control device programmed to use a toner for the front face of the binder layer 20 by the print-on-demand approach, and to print the configuration of the printing layer 30 which the print-on-demand machine concerned mentioned above. In addition, the white toner adopted the pigment of a titanium oxide system or a silicon system among the above-mentioned toners, and the black toner adopted the carbon black system pigment.

[0033] A deer is carried out and the transparence substrate 10 with which the binder layer 20 was formed as mentioned above is set to the above-mentioned print-on-demand machine. And the print-on-demand machine concerned is controlled by the above-mentioned control device, and it prints that the above-mentioned toner is also so that it may become the configuration of the printing layer 30 mentioned above on the front face of the binder layer 20. The light transmission concentration as a non-translucent part of 30g of backgrounds is measured with DMby great Japan screen company 500 mold transmission density meter, and since it is [2.0 or more] required, as for the count of printing of a black toner, it is desirable to consider as about 2 times or more.

[0034] As mentioned above, since it was made to carry out printing formation on the front face of the binder layer 20 which does not print the printing layer 30 on the front face of the transparence substrate 10 directly, but it comes to form in the front face of the transparence substrate 10, the printing layer 30 concerned may be uniformly stuck to the basis of the adhesive strength of the binder layer 20, and the front face of the transparence substrate 10 through the binder layer 20. Consequently, even if it uses the print-on-demand approach by the above-mentioned print-on-demand machine, the printing layer 30 does not exfoliate from the transparence substrate 10. Thereby, the stability of the repeat of printing and the adhesion of a color-material layer in the printing layer 30 can be improved.

[0035] Moreover, multi-form smallness lot printing is realizable in quick and low cost, canceling certainly the fault in the case of being based on the screen-stencil approach stated at the beginning of this specification in manufacture of the instrument board by using the print-on-demand approach in this way.

[0036] The appropriate back, with the above-mentioned print-on-demand machine, a lusterless ingredient is printed in the shape of a layer on the front face of the printing layer 30, and the gloss adjustment layer 40 is formed. Although it is necessary to lower the glossiness (the degree of gloss) of this gloss adjustment layer 40 to a predetermined value, in the instrument board for passenger cars, at 60 include angles, it is desirable that it is 20 or less, and with [the glossiness concerned] ten [or less], it is still more suitable. It was made to have lightfastness by using transparence additives, such as a silica and acrylic resin powder, as the above-mentioned lusterless ingredient from such a viewpoint.

[0037] With this operation gestalt, the gloss adjustment layer 40 is formed by the following approach. That is, it is the approach of printing on the front face of the binder layer 20 in the shape of a halftone dot, and printing in the shape of a laminating to homogeneity with a print-on-demand method, using transparent ink or a transparent toner.

[0038] since the minute organization potency force of a halftone dot is as low as 40 thru/or 80 lines / inch and a halftone dot is visible to a pattern in screen-stencil — general — a mat — material — although irregularity is given to the front face of a printing layer with the additive, since the minute nature 100 lines / more than an inch is obtained, according to the method on demand, it is possible to form that it is also in a transparent printing layer about homogeneity and a fine halftone dot, or a detailed pattern. Since these halftone dots or detailed patterns are very fine, an exterior is visible to lusterless processing. Moreover, it is not only suitable at the time of production of a small printing lot, but according to such an approach, there is an advantage that data can also perform control of glossiness.

[0039] A certain amount of thickness is required for the method on demand for forming the gloss adjustment layer concerned, and the method on demand using the ink or the toner which is not liquefied is suitable from a viewpoint which gives a feeling of irregularity. Specifically, a thermofusion mold hot printing method or the electrophotography method using a solid toner is suitable for formation of a gloss adjustment layer. Moreover, in order to raise the endurance of a printing layer to the gloss adjustment layer concerned, it is also possible to add UV absorbent. Moreover, the transparent material of a gloss adjustment layer does not necessarily need to be transparent, and may be an ingredient of coloring of the range which does not affect the print color of a substrate, or the color of a same color network. Manufacture of the instrument board concerned is completed by the above.

[0040] In addition, even if it adopted the thermofusion mold imprint method printing machine and carried out printing formation of the printing layer 30 on the front face of the binder layer 20 with this printing machine as a print-on-demand machine stated with the above-mentioned operation gestalt, the same printing layer 30 was able to be obtained with the above-mentioned operation gestalt having described. Here, as for the pigment system used for an ink ribbon, in a thermofusion mold imprint method printing machine, it is desirable from a light-fast point that it is the same pigment system as the thing of an electrophotography method. Although it is possible to make non-translucency higher than the thing of an electrophotography method by adjustment of the thickness of the ink layer of a ribbon, a pigment ratio, etc. from the point of concentration, it is desirable to perform multiple-times printing of black printing material from

the point of generating prevention of a pinhole. Moreover, in the case of a thermofusion mold imprint method, it has the thermofusion ink layer of an ink ribbon, and the mold release layer which receives the interface of base material polyester film imprint nature, but it is possible by adding mat material in this layer to lower the gloss on the front face of a print.

[0041] Moreover, in operation of this invention, a binder layer is formed in the rear face of a transporence substrate, a printing layer is formed in the external surface of this glue line unlike the above-mentioned operation gestalt, and you may make it form a gloss adjustment layer in the front face of a transporence substrate.

[0042] Moreover, although it was made to carry out printing formation also of the gloss adjustment layer 40 with a print-on-demand machine, it replaces with this and you may make it print on the front face of the printing layer 30 with a screen printer about the gloss adjustment layer 40 with the above-mentioned operation gestalt using Jujo Chemical 2 acidity-or-alkalinity lusterless clear ink. Thus, as for the manufactured instrument board, there is little change of glossiness in a 100-degree C ambient atmosphere, and it is suitable for it as the instrument board of the instrument exposed to hot environments according to installation situations, such as the light source.

[0043] Moreover, as the binder layer 20 and the printing layer 30 are formed in the rear face of this transporence substrate, you may make it also give a role of a gloss adjustment layer to the transporence substrate 10 as a transporence substrate 10 using the tabular polycarbonate (MOby Mitsubishi Gas Chemical Co., Inc. 1 mold) which has an embossing configuration on a front face. In addition, what coated the coating material which added the bead and mat material of predetermined grain size in advance is sufficient as the embossing configuration of the front face of a transporence substrate. In addition, when it got damaged and ***** was taken into consideration, the detailed acrylic bead was the optimal as a bead of predetermined grain size.

[0044] Moreover, you may carry out by the following approaches, without restricting to the approach which stated formation of the gloss adjustment layer 40 with the above-mentioned operation gestalt in operation of this invention.

[0045] By the 1st approach, when a printing lot is to some extent large, mat clear ink is screen-stenciled on the front face of the binder layer 20. According to this approach, since it is not necessary to make the printing version for every printing pattern of the instrument board, it can print with the shared printing version. Since platemaking and a lithographic plate manufacture process are not needed each time, there is no big cost rise. Moreover, since the class of ink can be chosen, it is using heat-resistant high ink from the condensation by the-like factor for an environment of the toner of the printing layer formed of print on demand, or ink, for example, heat, humidity, and light, oxidation, etc. A printing layer can be protected. For example, as mat clear ink, the bridge formation mold ink of 2 acidity or alkalinity is effective.

[0046] There is the approach of carrying out the laminating of the film of the predetermined glossiness which has an adhesive layer and a glue line with a laminator etc. at ordinary temperature or an elevated temperature as the 2nd approach. According to this approach, since film thickness is securable, it is also possible to add many UV absorbers etc. and, in the case of the print on demand which can choose only a weak color material to ultraviolet rays, it is effective. As an example of a film, fluorine system films, such as the Du Pont TEDORA film and AFUREKKUSU by the Asahi glass company, are suitable from thermal resistance, lightfastness, etc., for example.

[0047] Moreover, in the printing layer of the instrument board stated with the above-mentioned operation gestalt, it screen-stencils in operation of this invention except for the field which contains a translucent part among backgrounds, and may be made to perform print on demand only to the field containing the above-mentioned translucent part.

[0048] Here, if screen-stencil and print on demand are used together as screen-stencil prints the graduation section in which the part into which the contents of a display, such as a speedometer, are seldom changed will be printed by screen-stencil among an approach reason producible by low cost, and the graduation section of the instrument board if the number of printing lots is large, for example, it tends to change the contents of a display by the displacement and the grade of a passenger car like the graduation section of a tachometer by

the method on demand, it will become still more nearly producible at low cost.

[0049] In this case, it is also possible not to print a printing layer directly to a transparence substrate, but to once print it on an easily-adhesive processing polyethylene terephthalate film etc., and to imprint this film on the front face of a transparence substrate as an imprint foil. The case where the front face of a transparence substrate is not flat, and a transparence substrate are thick, and it is effective when trouble is in the conveyance system of a printing machine.

[0050] Moreover, generally this invention may be applied to the instrument board of the instrument for cars of an automobile and others, or the plotting board of a display, without restricting to the instrument board of the instrument for passenger cars in operation of this invention.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the front view of the instrument board in which 1 operation gestalt of this invention is shown.

[Drawing 2] It is the sectional view which meets two to 2 line in drawing 1 .

[Description of Notations]

10 [— The graduation section, 30e / — A direction directions display, 30g / — A background, 40 / — Gloss adjustment layer.] — A transparence substrate, 20 — A binder layer, 30 — A printing layer, 30a, or 30d

[Translation done.]